

CLAIMS:

1. A battery comprising two half-cells which are in an electrochemical contact with one another through an electrically neutral alkaline ionic conductor, wherein one of said half-cells comprises an anode and the other half-cell comprises a cathode, whereby electrical discharge is accomplished via reduction of the cathode and oxidation of the anode, and whereby said cathode includes an oxidized silver salt encapsulated powder.

2. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized manganese containing compound.

3. The battery according to Claim 2 whereby said compound contains a Mn(VI) valent salt.

4. The battery according to Claim 3 whereby said Mn(VI) valent salt is barium manganate, BaMnO_4 .

5. The battery according to Claim 3 whereby said Mn(VI) valent salt is potassium manganate, K_2MnO_4 .

6. The battery according to Claim 3 whereby said Mn(VI) valent salt is MgMnO_4 , CaMnO_4 , SrMnO_4 , Na_2MnO_4 , Li_2MnO_4 , Rb_2MnO_4 , Cs_2MnO_4 , ammonium manganate, or a tetra alkyl ammonium manganate.

7. The battery according to Claim 2 whereby said compound contains a Mn(VII) valent salt.

8. The battery according to Claim 3 whereby said Mn(VII) valent salt is potassium permanganate, KMnO_4 .

9. The battery according to Claim 3 whereby said Mn(VII) valent salt is NaMnO_4 , LiMnO_4 , RbMnO_4 , CsMnO_4 , ammonium permanganate, or a tetra alkyl ammonium permanganate.

10. The battery according to Claim 2 whereby said compound contains a Mn(IV) valent salt.

11. The battery according to Claim 10 whereby said Mn(IV) valent salt is manganese dioxide.

12. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized nickel containing compound.

13. The battery according to Claim 12 whereby said compound contains a nickel oxide salt.

14. The battery according to Claim 12 whereby said compound contains a nickel oxyhydroxide salt.

15. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized mercury containing compound.

16. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized lead containing compound.

17. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized copper containing compound.

18. The battery according to Claim 1 whereby said encapsulated powder contains zero valent sulfur.

19. The battery according to Claim 1 whereby said encapsulated powder contains a polysulfide including zero valent sulfur and reduced sulfur.

20. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized cobalt containing compound.

21. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized vanadium containing compound.

22. The battery according to Claim 1 whereby said encapsulated powder is an encapsulated oxidized iron containing compound.

23. The battery according to Claim 22 whereby said encapsulated powder contains a compound which includes iron in a valence state of greater than 3.

24. The battery according to Claim 23 whereby said oxidized iron containing compound includes BaFeO_4 .

25. The battery according to Claim 23 whereby said oxidized iron containing compound includes K_2FeO_4 .

26. The battery according to Claim 23 whereby said oxidized iron containing compound includes Na_2FeO_4 , Li_2FeO_4 , Cs_2FeO_4 , Rb_2FeO_4 , H_2FeO_4 , $(\text{NH}_4)_2\text{FeO}_4$, $(\text{N}(\text{C}_4\text{H}_9)_4)_2\text{FeO}_4$, BeFeO_4 , MgFeO_4 , CaFeO_4 , SrFeO_4 , $\text{La}_2(\text{FeO}_4)_3$, $\text{CeFeO}_4 \cdot 2\text{H}_2\text{O}$, $\text{Ce}_2(\text{FeO}_4)_3$, Hg_2FeO_4 , HgFeO_4 , Cu_2FeO_4 , CuFeO_4 , ZnFeO_4 , Ag_2FeO_4 , FeO_3 , FeFeO_4 , $\text{Fe}_2(\text{FeO}_4)_3$, CrFeO_4 , MnFeO_4 , NiFeO_4 , CoFeO_4 , $\text{Al}_2(\text{FeO}_4)_3$, $\text{In}_2(\text{FeO}_4)_3$, $\text{Ga}_2(\text{FeO}_4)_3$, SnFeO_4 , PbFeO_4 , $\text{Sn}(\text{FeO}_4)_2$, or $\text{Pb}(\text{FeO}_4)_2$.

27. The battery according to Claim 1 whereby said oxidized silver salt encapsulation of a powder is accomplished by a coating of metallic silver which is then oxidized.

28. The battery according to Claim 1 whereby said oxidized silver salt encapsulation of a powder is accomplished with a solution containing a dissolved silver salt.

29. The battery according to Claim 28 whereby said powder to be encapsulated is highly insoluble in said solution.

30. The battery according to Claim 28 whereby said encapsulation is further accomplished by solvent evaporation from said solution.

31. The battery according to Claim 28 whereby said encapsulation is further accomplished by salting out of said dissolved silver salt from said solution.

32. The battery according to Claim 1 whereby said silver salt includes an $\text{Ag}(\text{I})$ valent salt.

33. The battery according to Claim 32 whereby said $\text{Ag}(\text{I})$ valent salt includes Ag_2O or AgOH or includes an anion from the list nitrate,

nitrite, halide, halate, perhalate, halite, acetate, carbonate, fulminate, lactate, acetylide, levunilate, oxalate, palimate, cyanate, thiocyanate, benzoate, propionate, salicyate, stearate, tartrate, tetraborate, sulfate, thiosulfate, dithionate, selenate, selenide, telluride, tungstate, azide, phosphate, orthophosphate or pyrophosphate.

34. The battery according to Claim 1 whereby said silver salt includes an Ag(II) valent salt.

35. The battery according to Claim 34 whereby said Ag(II) valent salt includes AgO, Ag₂O₂ or Ag(OH)₂ or includes an anion from the list nitrate, nitrite, halide, halate, perhalate, halite, acetate, carbonate, fulminate, lactate, acetylide, levunilate, oxalate, palimate, cyanate, thiocyanate, benzoate, propionate, salicyate, stearate, tartrate, tetraborate, sulfate, thiosulfate, dithionate, selenate, selenide, telluride, tungstate, azide, phosphate, orthophosphate or pyrophosphate.

36. The battery according to Claim 30 whereby said Ag(I) salt is oxidized.

37. The battery according to Claim 27 or 36 whereby said oxidation is accomplished through contact with an oxidizing agent.

38. The battery according to Claim 37 whereby said oxidizing agent is a hypochlorite salt.

39. The battery according to Claim 39 whereby said oxidizing agent is a peroxydisulfate salt.

40. The battery according to Claim 27 or 36 whereby said oxidation is accomplished electrochemically by application of a positive voltage.

41. The battery according to Claim 1, wherein said cell is rechargeable by application of a voltage in excess of the discharge cell open circuit potential.

42. A battery comprising two half-cells which are in an electrochemical contact with one another through an electrically neutral alkaline ionic conductor, wherein one of said half-cells comprises an anode and the other half-cell comprises a cathode, whereby electrical discharge is accomplished via reduction of the cathode and oxidation of the anode, and whereby said cathode includes at least 1% of weight of barium permanganate.